Wesgreen International School | Inspiring Excellence, Empowering Global Minds

Programme of Study – Year 10 Chemistry 2023-24 (Edexcel)

Specification (pearson.com)

	Theme	Overview of key learning to take place	How learning will be assessed
Term 1	**Section 1: Principles of chemistry** (a) States of matter	Students will be assessed on their ability to: 1.1 understand the three states of matter in terms of the arrangement, movement and energy of the particles 1.2 understand the interconversions between the three states of matter in terms of: ● the names of the interconversions ● how they are achieved ● the changes in arrangement, movement and energy of the particles 1.3 understand how the results of experiments involving the dilution of col Students will be assessed on their ability to: 1.4 know what is meant by the terms: solvent, solute , solution , saturated solution **1.5C know what is meant by the term solubility in the units g per 100 g of solvent** **1.6C understand how to plot and interpret solubility curves** **1.7C practical: investigate the solubility of a solid in water at a specific temperature.oured solutions and diffusion of gases can be explained**.	 **Examples of Formative Assessment to be used this term:** In class peer and self-assessment of extended answer questions Homework questions **Summative assessment:** Baseline Assessment Mid Term assessment End of term assessments

Term 1	**Section 1: Principles of chemistry** (b) Elements, compounds and mixtures	Students will be assessed on their ability to: 1.14 know what is meant by the terms atom and molecule 1.8 understand how to classify a substance as an element, a compound or a mixture 1.9 understand that a pure substance has a fixed melting and boiling point, but that a mixture may melt or boil over a range of temperatures 1.10 describe these experimental techniques for the separation of mixtures: ● simple distillation ● fractional distillation ● filtration ● crystallisation.	
		Students will be assessed on their ability to: 1.10 describe these experimental techniques for the separation of mixtures: paper chromatography 1.11 understand how a chromatogram provides information about the composition of a mixture 1.12 understand how to use the calculation of R_f values to identify the components of a mixture 1.13 *practical: investigate paper chromatography using inks/food colourings.*	
Term 1	**Section 1: Principles of chemistry** (c) Atomic structure	Students will be assessed on their ability to: 1.15 know the structure of an atom in terms of the positions, relative masses and relative charges of subatomic particles	Mid Term Assessment on **Section 1: Principles of chemistry** (a) States of matter (b) Elements, compounds and mixtures

		1.16 know what is meant by the terms atomic number, mass number, isotopes and relative atomic mass (A_r) 1.17 be able to calculate the relative atomic mass of an element (A_r) from isotopic abundances.	(c) Atomic structure 
Term 1	**Section 1: Principles of chemistry** (d) The Periodic Table	Students will be assessed on their ability to: 1.18 understand how elements are arranged in the Periodic Table: ● in order of atomic number ● in groups and periods 1.19 understand how to deduce the electronic configurations of the first 20 elements from their positions in the Periodic Table 1.20 understand how to use electrical conductivity and the acid-base character of oxides to classify elements as metals or non-metals 1.21 identify an element as a metal or a non-metal according to its position in the Periodic Table 1.22 understand how the electronic configuration of a main group element is related to its position in the Periodic Table 1.23 understand why elements in the same group of the Periodic Table have similar chemical properties 1.24 understand why the noble gases (Group 0) do not readily react.	
Term 1	**Section 1: Principles of chemistry** (f) Ionic bonding	Students will be assessed on their ability to: 1.37 understand how ions are formed by electron loss or gain 1.38 know the charges of these ions:	

		• metals in Groups 1, 2 and 3 • non-metals in Groups 5, 6 and 7 • Ag+, Cu2+, Fe2+, Fe3+, Pb2+, Zn2+ • hydrogen (H+), hydroxide (OH–), ammonium (NH4+), carbonate (CO32–), nitrate (NO3-), sulfate (SO42–) 1.39 write formulae for compounds formed between the ions listed above 1.40 draw dot-and-cross diagrams to show the formation of ionic compounds by electron transfer, limited to combinations of elements from Groups 1, 2, 3 and 5, 6, 7 *only outer electrons need be shown.*	
	Section 1: Principles of chemistry (f) Ionic bonding	Students will be assessed on their ability to: 1.41 understand ionic bonding in terms of electrostatic attractions 1.42 understand why compounds with giant ionic lattices have high melting and boiling points 1.43 know that ionic compounds do not conduct electricity when solid, but do conduct electricity when molten and in aqueous solution.	
	Section 1: Principles of chemistry (g) Covalent bonding	Students will be assessed on their ability to: 1.44 know that a covalent bond is formed between atoms by the sharing of a pair of electrons 1.45 understand covalent bonds in terms of electrostatic attractions 1.46 understand how to use dot-and-cross diagrams to represent covalent bonds in: • diatomic molecules, including hydrogen, oxygen, nitrogen, halogens and hydrogen halides	

		• inorganic molecules including water, ammonia and carbon dioxide • organic molecules containing up to two carbon atoms, including methane, ethane, ethene and those containing halogen atoms.	
	Section 1: Principles of chemistry (g) Covalent bonding	Students will be assessed on their ability to: 1.47 explain why substances with a simple molecular structures are gases or liquids, or solids with low melting and boiling points *the term intermolecular forces of attraction can be used to represent all forces between molecules* 1.48 explain why the melting and boiling points of substances with simple molecular structures increase, in general, with increasing relative molecular mass 1.49 explain why substances with giant covalent structures are solids with high melting and boiling points 1.50 explain how the structures of diamond, graphite and C_{60} fullerene influence their physical properties, including electrical conductivity and hardness. Metallic Bonding: Students will be assessed on their ability to: **1.52C know how to represent a metallic lattice by a 2-D diagram** **1.53C understand metallic bonding in terms of electrostatic attractions**	

		1.54C explain typical physical properties of metals, including electrical conductivity and malleability	
	Section 1: Principles of chemistry (d) The Periodic Table (f) Ionic bonding (g) Covalent bonding	Consolidation and assessment	
	Section 2: Inorganic chemistry (a) Group 1 (alkali metals)	Students will be assessed on their ability to: 1.25 write word equations and balanced chemical equations (including state symbols): ● for reactions studied in this specification ● for unfamiliar reactions where suitable information is provided 2.1 understand how the similarities in the reactions of these elements with water provide evidence for their recognition as a family of elements 2.2 understand how the differences between the reactions of these elements with air and water provide evidence for the trend in reactivity in Group 1 2.3 use knowledge of trends in Group 1 to predict the properties of other alkali metals **2.4C explain the trend in reactivity in Group 1 in terms of electronic configurations.**	

	Section 2: Inorganic chemistry (b) Group 7 (halogens)	Students will be assessed on their ability to: 2.5 know the colours, physical states (at room temperature) and trends in physical properties of these elements 2.6 use knowledge of trends in Group 7 to predict the properties of other halogens 2.7 understand how displacement reactions involving halogens and halides provide evidence for the trend in reactivity in Group 7 **2.8C explain the trend in reactivity in Group 7 in terms of electronic configurations.**	
		End of Term Assessment on **Section 1(a to g) Section 2 (a,b)**	

	Theme	**Overview of key learning to take place**	**How learning will be assessed**
Term 2	**Section 3: Physical chemistry** (a) Energetics	Students will be assessed on their ability to:	 **Examples of Formative Assessment to be used this term:** In class peer and self-assessment of extended answer questions Homework questions **Summative assessment:** Baseline Assessment Mid Term assessment End of term assessments

		3.1 know that chemical reactions in which heat energy is given out are described as exothermic, and those in which heat energy is taken in are described as endothermic 3.2 describe simple calorimetry experiments for reactions such as combustion, displacement, dissolving and neutralisation 3.3 calculate the heat energy change from a measured temperature change using the expression $Q = mc\Delta T$ 3.4 calculate the molar enthalpy change (ΔH) from the heat energy change, Q.	
Term 2	**Section 3: Physical chemistry** (a) Energetics	Students will be assessed on their ability to: **3.5C draw and explain energy level diagrams to represent exothermic and endothermic reactions** **3.6C know that bond-breaking is an endothermic process and that bond-making is an exothermic process** • **3.7C use bond energies to calculate the enthalpy change during a chemical reaction.**	
	Section 3: Physical chemistry (a) Energetics	Students will be assessed on their ability to: *3.8 practical: investigate temperature changes accompanying some of the following types of change:* • *salts dissolving in water* • *neutralisation reactions*	

		• *displacement reactions* • *combustion reactions .*	
Term 2	**Section 3: Physical chemistry** (b) Rates of reaction	Students will be assessed on their ability to: 3.9 describe experiments to investigate the effects of changes in surface area of a solid, concentration of a solution, temperature and the use of a catalyst on the rate of a reaction 3.10 describe the effects of changes in surface area of a solid, concentration of a solution, pressure of a gas, temperature and the use of a catalyst on the rate of a reaction 3.11 explain the effects of changes in surface area of a solid, concentration of a solution, pressure of a gas and temperature on the rate of a reaction in terms of particle collision theory 3.15 *practical: investigate the effect of changing the surface area of marble chips and of changing the concentration of hydrochloric acid on the rate of reaction between marble chips and dilute hydrochloric acid.*	Mid Term Assessment on **Section 3: Physical chemistry** (a) Energetics (b) Rates of Reaction. 
Term 2	**Section 3: Physical chemistry** (b) Rates of reaction	Students will be assessed on their ability to: 3.12 know that a catalyst is a substance that increases the rate of a reaction, but is chemically unchanged at the end of the reaction 3.13 know that a catalyst works by providing an alternative pathway with lower activation energy **3.14C draw and explain reaction profile diagrams showing ΔH and activation energy** 3.16 *practical: investigate the effect of different solids on the catalytic decomposition of hydrogen peroxide solution.*	

Term 2	**Section 3: Physical chemistry** (c) Reversible reactions and equilibria	Students will be assessed on their ability to: 3.17 know that some reactions are reversible and this is indicated by the symbol ⇌ in equations 3.18 describe reversible reactions such as the dehydration of hydrated copper(II) sulfate and the effect of heat on ammonium chloride.	
Term 2	**Section 3: Physical chemistry** (c) Reversible reactions and equilibria	Students will be assessed on their ability to: **3.19C know that a reversible reaction can reach dynamic equilibrium in a sealed container** **3.20C know that the characteristics of a reaction at dynamic equilibrium are:** • **the forward and reverse reactions occur at the same rate** • **the concentrations of reactants and products remain constant** **3.21C understand why a catalyst does not affect the position of equilibrium in a reversible reaction** **3.22C predict, with reasons, the effect of changing either pressure or temperature on the position of equilibrium in a reversible reaction; *references to Le Chatelier's principle are not required.***	 
Term 3	**Section 2: Inorganic chemistry** (d) Reactivity series	Students will be assessed on their ability to: 2.15 understand how metals can be arranged in a reactivity series based on their reactions with: • water • dilute hydrochloric or sulfuric acid 2.16 understand how metals can be arranged in a reactivity series based on their displacement reactions between:	

		• metals and metal oxides • metals and aqueous solutions of metal salts 2.17 know the order of reactivity of these metals: potassium, sodium, lithium, calcium, magnesium, aluminium, zinc, iron, copper, silver, gold 2.21 *practical: investigate reactions between dilute hydrochloric and sulfuric acids and metals (e.g. magnesium, zinc and iron).*	
	Section 2: Inorganic chemistry (d) Reactivity series	Students will be assessed on their ability to: 2.18 know the conditions under which iron rusts 2.19 understand how the rusting of iron may be prevented by: • barrier methods • galvanising • sacrificial protection 2.20 in terms of gain or loss of oxygen and loss or gain of electrons, understand the terms: • oxidation • reduction • redox • oxidising agent reducing agent, in terms of gain or loss of oxygen and loss or gain of electrons.	
Term 3	**Section 2: Inorganic chemistry** (e) Extraction and uses of metals	Students will be assessed on their ability to: **2.22C know that most metals are extracted from ores found in the Earth's crust and that unreactive metals are often found as the uncombined element** **2.23C explain how the method of extraction of a metal is related to its position in the reactivity series, illustrated by carbon extraction for iron and electrolysis for aluminium**	

		2.24C be able to comment on a metal extraction process, given appropriate information ***detailed knowledge of the processes used in the extraction of a specific metal is not required.***	
Term 3	**Section 1: Principles of chemistry** (i) Electrolysis	Students will be assessed on their ability to: **1.58C describe experiments to investigate electrolysis, using inert electrodes, of molten compounds (including lead(II) bromide) and aqueous solutions (including sodium chloride, dilute sulfuric acid and copper(II) sulfate) and to predict the products** **1.59C write ionic half-equations representing the reactions at the electrodes during electrolysis and understand why these reactions are classified as oxidation or reduction** **1.60C *practical: investigate the electrolysis of aqueous solutions.***	
		End of Term Assessment